disturbances following the first attack, since just beneath this region the sensory fibers for the entire body are most compactly grouped. The autopsy fully confirmed the diagnosis. There were several small cortical lesions and an old lesion in the pons—all without significance for the present discussion. Besides these, however, there was a fresh lesion in the third member of the right lenticular nucleus, which would easily involve the pyramidal tract, while the white matter of the lower portion of the right parietal lobe was completely softened, thus fully accounting for the other symptoms. A review of the literature brought to light a considerable amount of evidence showing conjugate deviation of the eyes in similar lesions of the parietal lobe.

Die Beziehungen der hinteren Rindengebiete zum epileptischen Anfall. H. UNVERRICHT. Deutsch. Archiv f. klin. Med. XLIV, 1, S. 1. Reviewed by Ziehen, Centralbl. f. Physiol. No. 25, 1889.

The starting point for an epileptic attack is usually thought of as in the motor region of the cortex, but Unverricht considers it as clinically established that a strictly local affection of the posterior cortical regions can of itself bring about convulsions. He seeks to demonstrate the point on dogs, in which the stimulation, especially of the posterior and superior portions of the second arched convolution (counting from the middle line) causes contractions. There is lateral motion of the eyes to the opposite side, with dilation of the pupils as one of the results. These are not explained as reflexes from sensory stimuli (Ferrier), but as the result of direct stimulation of motor centers. But this is simply the author's view, for which the evidence is lacking thus far.

The length of time the stimulus is continued is more important than the strength of the stimulus, in determining an attack from this posterior cortical area. The order of contractions often fails to follow the order of the centers, and at times the convulsions roused from one visual area are limited to one half of the body. Most important are two experiments in which on the left side all the motor region save that for the movements of the eyes had been removed. The visual area was then stimulated on the left side, and the convulsion appeared on the *same* side. When a transverse cut was made through the cortex of one hemisphere at the anterior edge of the visual area, then stimulation of the latter caused a convulsion in which the orbicularis contracted after the extremities, from which he concludes that the impulse travels through deep-lying connections. At the end some clinical evidence is presented.

Kleine Beiträge, betreffend die Anordnung der Geschmacksknospen bei den Säugethieren. J. HÖNIGSCHMIED. Zeitschr. f. wiss. Zool., Vol. XLVII, 1888, S. 190–200.

This paper contains the results of the author's further studies upon the arrangement of the gustatory papillae and distribution of the taste-bulbs in mammals. In *Felis lynx* there are present six papillae of the circumvallate type, but the foliate papillae are wanting. The taste-bulbs are rather narrow and disposed in a zone of 3 to 5 tiers. *Ursus fuscus* has about twenty circumvallate papillae, and also well-developed foliate organs. The taste-bulbs are oval or cylindrical in form and, in the circumvallate papillae, are arranged

in a zone of 21 to 25 tiers. In vertical section the folds of the foliate organs show 5 to 20 rows of bulbs. *Equus asinus*, like the horse and mule, has two circumvallate papillae and foliate organs. The taste-bulbs are long and narrow, and those of the circumvallate papillae are arranged in a girdle of 5 to 10 tiers. The folds of the foliate areas contain 5 to 10 rows of bulbs. In *Cricetus frumentarius* the foliate type of taste organ is present, but circumvallate areas are lacking, although Mayer mentions finding a single circumvallate papilla in the hameter. The folds of the papillae foliatae bear from 2 to 10 rows of nearly spherical bulbs. *Sus scrofa*, like the domesticated pigs, possesses two circumvallate papillae and foliate structures. In the former region the bulbs are long and narrow, and the tiers vary in number from 7 to 25. The folds of the foliate papilla show 5 to 16 rows of bulbs. In *Mus sylvaticus* there is but one circumvallate papilla, while *Myoxus avellanarius* possesses three papillae of this type. In neither of these species, apparently, was a thorough search made for foliate taste areas. In none of the animals investigated were taste-bulbs detected in the epithelium of the upper surface of the circumvallate or foliate papillae, nor were any found in that lining the outer wall of the trenches encircling the former. Hönigschmied found fungiform papillae bearing taste-bulbs in *E. asinus*, *S. scrofa*, *C. frumentarius* and *M. avellanarius*. Both Hönigschmied and Brücher regard the circumvallate papillae as modifications of the fungiform type. While this hypothesis may be true in the case of certain individual papillae, it seems highly probable that the circumvallate papilla, as a distinct taste area, has been developed through a long series from the gustatory or bulb-bearing ridges. These ridges, which have been found in *Ornithorhynchus anatinus* and *Belideus ariel*, are probably the nearest approach among living animals to the primitive type of gustatory area of Mammalia, and are doubtless the forerunners of the circumvallate type of papilla. F. T.

II.—EXPERIMENTAL.

Ueber die Helligkeitsempfindung im indirecten Sehen. A. KIRSCHMANN. Philosophische Studien, V, 3, pp. 447–497.

Kirschmann, without having seen the work of A. E. Fick, examined the lateral portion of the retina in regard to its sensitiveness to brightness. His results are of a different nature from Fick's, for his eyes were examined under ordinary conditions, and Fick's only after prolonged adaptation. He finds an increase of sensitiveness amounting to a fraction of the whole—one-seventh for 20° away from the center—while Fick found a sensitiveness fifteen times as great as at the center. The latter result is plainly very different from anything which takes place under ordinary conditions, or we should not fail to be easily aware of it.

The different parts of the retina differ in respect to (1) the distinctness, (2) the quality, and (3) the intensity of the sensations which they convey. (1) On account of the unfavorable conditions for refraction and accommodation, the images on the side parts of the retina are not good; but this alone is not enough to account for the degree of indistinctness of vision that prevails there—the eyes of